

CLAIMS

What is claimed is:

- 1 ^{sub} 1. A method of monitoring an oxygen partial pressure in an air mask of an
2 oxygen system, comprising:
3 generating a signal corresponding to the oxygen partial pressure in the air mask,
4 the signal generated independently of the oxygen system;
5 comparing the generated signal with a reference signal corresponding to a desired
6 oxygen partial pressure; and
7 vibrating a portion of the air mask if the generated signal is determined to be
8 lower than the reference signal.
- 1 2. The method according to claim 1, further comprising detecting the oxygen
2 partial pressure in the air mask.
- 1 3. The method according to claim 1, further comprising sounding an alarm if
2 the generated signal is determined to be lower than the reference signal.
- 1 4. The method according to claim 1, further comprising amplifying the
2 generated signal.

1 5. The method according to claim 1, further comprising selectively shutting
2 off the generated signal.

1 6. The method according to claim 1, wherein the generated signal is an
2 electric current, further comprising converting the electric current into a corresponding
3 voltage.

1 7. The method according to claim 1, wherein the generated signal is an
2 analog signal, further comprising digitizing the analog signal into a digital signal having a
3 predetermined number of bits.

1 8. The method according to claim 6, wherein the reference signal is stored in
2 a memory unit, the comparing step comprising comparing the digitized generated signal
3 with the stored reference signal.

1 9. The method according to claim 1, wherein the desired signal corresponds
2 to an oxygen partial pressure of about 0.13 or more atmospheres.

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1 10. An apparatus for monitoring an oxygen partial pressure in an air mask of
2 an oxygen system, comprising.

3 a sensor mounted in the air mask and capable of providing an output signal
4 corresponding to the oxygen partial pressure in the air mask;

5 a comparator connected to the sensor and configured to compare the output signal
6 with a reference signal corresponding to a desired oxygen partial pressure;

7 a power source connected to the sensor and the comparator, the power source
8 being independent of the oxygen system; and

9 a vibrator connected to the comparator and configured to vibrate if the generated
10 signal is determined to be lower than the reference signal.

1 11. The apparatus according to claim 10, further comprising an alarm
2 connected to the comparator and configured to activate if the generated signal is
3 determined to be lower than the reference signal.

1 12. The apparatus according to claim 10, further comprising an amplifier
2 connected to the sensor and the comparator and configured to amplify the output signal.
3

1 13. The apparatus according to claim 10, wherein the power source is a
2 communications system power source.

1 14. The apparatus according to claim 10, wherein the power source is a
2 battery unit.

1 15. The apparatus according to claim 10, further comprising a switch
2 selectively capable of disconnecting the power source.

1 16. The apparatus according to claim 10, wherein the output signal is an
2 electric current, further comprising a current to voltage converter capable of converting
3 the electric current into a corresponding voltage.

1 17. The apparatus according to claim 10, wherein the output signal is an
2 analog signal, further comprising a digitizer capable of digitizing the analog signal into a
3 digital signal having a predetermined number of bits.

1 18. The apparatus according to claim 17, wherein the reference signal is stored
2 in a memory unit, and the comparator is configured to compare the digitized output signal
3 with the stored reference signal.

1 19. The apparatus according to claim 10, wherein the desired signal
2 corresponds to an oxygen partial pressure of about 0.13 or more atmospheres.

1 20. The apparatus according to claim 10, wherein the sensor, comparator, and
2 vibrator are integrated into a single unit.

1 21. The apparatus according to claim 10, wherein the air mask is configured to
2 be fitted on an aircraft pilot's helmet.

1 22. The apparatus according to claim 20, wherein the air mask is configured to
2 be mounted on an aircraft pilot's helmet.

1 23. The apparatus according to claim 10, wherein the air mask is configured to
2 be fitted on a firefighter's helmet.

1 24. The apparatus according to claim 10, wherein the vibrator is attached to an
2 inner surface of the air mask.

1 25. The apparatus according to claim 10, wherein the vibrator is attached to an
2 outer surface of the air mask.

1 26. A device for monitoring an oxygen partial pressure in an air mask of an
2 oxygen system, comprising.

3 means for generating a signal corresponding to the oxygen partial pressure in the
4 air mask;

5 means for comparing the generated signal with a reference signal corresponding
6 to a desired oxygen partial pressure;

7 means for powering the generating means and the comparing means
8 independently of the oxygen system; and

9 means for vibrating a portion of the air mask if the generated signal is determined
10 to be lower than the reference signal.

1 27. The device according to claim 26, further comprising sounding an alarm if
2 the generated signal is determined to be lower than the reference signal.

1 28. The device according to claim 26, further comprising means for
2 amplifying the generated signal.

1 29. The device according to claim 26, further comprising means for
2 disconnecting the powering means.

1 30. The device according to claim 26, wherein the generated signal is an
2 electric current, further comprising means for converting the electric current into a
3 corresponding voltage.

1 31. The device according to claim 26, wherein the generated signal is an
2 analog signal, further comprising means for digitizing the analog signal into a digital
3 signal having a predetermined number of bits.

1 32. The device according to claim 26, wherein the desired signal corresponds
2 to an oxygen partial pressure of about 0.13 or more atmospheres.

1 33. An apparatus for monitoring an oxygen partial pressure in an oxygen mask
2 of an oxygen system of an aircraft, comprising.
3 a sensor mounted in the air mask and capable of providing an output signal
4 corresponding to the oxygen partial pressure in the air mask;
5 a comparator connected to the sensor and configured to compare the output signal
6 with a reference signal corresponding to a desired oxygen partial pressure;
7 an amplifier connected to the sensor and the comparator and configured to
8 amplify the output signal;
9 a power source connected to the sensor and the comparator, the power source
10 being derived from a communications cord of the aircraft;
11 a vibrating motor connected to the comparator and attached to a surface of the air
12 mask, the vibrating motor configured to vibrate if the generated signal is determined to be
13 lower than the reference signal;
14 an alarm connected to the comparator and configured to activate if the generated
15 signal is determined to be lower than the reference signal; and
16 a switch capable of allowing a user to selectively disconnect the power source.

1 34. A method of monitoring an oxygen partial pressure in an air mask of an
2 oxygen system, comprising:
3 generating a signal corresponding to the oxygen partial pressure in the air mask,
4 the signal generated independently of the oxygen system;
5 comparing the generated signal with a reference signal corresponding to a desired
6 oxygen partial pressure; and
7 activating an alarm connected to the air mask if the generated signal is determined
8 to be outside a predefined reference range.

1 35. The method according to claim 34, further comprising detecting the
2 oxygen partial pressure in the air mask.

1 36. The method according to claim 34, wherein the alarm is a vibrator
2 attached to the air mask.

1 37. The method according to claim 34, further comprising amplifying the
2 generated signal.

1 38. The method according to claim 34, further comprising selectively shutting
2 off the generated signal.

1 39. The method according to claim 34, wherein the generated signal is an
2 electric current, further comprising converting the electric current into a corresponding
3 voltage.

1 40. The method according to claim 34, wherein the generated signal is an
2 analog signal, further comprising digitizing the analog signal into a digital signal having a
3 predetermined number of bits.

1 41. The method according to claim 40, wherein the predefined reference range
2 is stored in a memory unit, the comparing step comprising comparing the digitized
3 generated signal with the stored reference range.

1 42. The method according to claim 34, wherein the predefined reference range
2 corresponds to a desired range of oxygen partial pressures.

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1 43. An apparatus for monitoring an oxygen partial pressure in an air mask of
2 an oxygen system, comprising.

3 a sensor mounted in the air mask and capable of providing an output signal
4 corresponding to the oxygen partial pressure in the air mask;

5 a comparator connected to the sensor and configured to compare the output signal
6 with a reference signal corresponding to a desired oxygen partial pressure;

7 a power source connected to the sensor and the comparator, the power source
8 being independent of the oxygen system; and

9 an alarm connected to the comparator and configured to actuate if the generated
10 signal is determined to be outside a predefined reference range.

1 44. The apparatus according to claim 43, wherein the alarm is a vibrator
2 attached to the air mask.

1 45. The apparatus according to claim 43, further comprising an amplifier
2 connected to the sensor and the comparator and configured to amplify the output signal.
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1 46. The apparatus according to claim 43, wherein the power source is a
2 communications system power source.

1 47. The apparatus according to claim 43, wherein the power source is a
2 battery unit.

1 48. The apparatus according to claim 43, further comprising a switch
2 selectively capable of disconnecting the power source.

1 49. The apparatus according to claim 43, wherein the output signal is an
2 electric current, further comprising a current to voltage converter capable of converting
3 the electric current into a corresponding voltage.

1 50. The apparatus according to claim 43, wherein the output signal is an
2 analog signal, further comprising a digitizer capable of digitizing the analog signal into a
3 digital signal having a predetermined number of bits.

1 51. The apparatus according to claim 50, wherein the predefined reference
2 range is stored in a memory unit, and the comparator is configured to compare the
3 digitized output signal with the stored reference range.

1 52. The apparatus according to claim 43, wherein the predefined reference
2 range corresponds to a desired range of oxygen partial pressures.

1 53. The apparatus according to claim 43, wherein the sensor, comparator, and
2 vibrator are integrated into a single unit.

1 54. The apparatus according to claim 43, wherein the air mask is configured to
2 be fitted on an aircraft pilot's helmet.

1 55. The apparatus according to claim 43, wherein the air mask is configured to
2 be fitted on a firefighter's helmet.

1 56. The apparatus according to claim 43, wherein the vibrator is attached to an
2 inner surface of the air mask.

1 57. The apparatus according to claim 43, wherein the vibrator is attached to an
2 outer surface of the air mask.